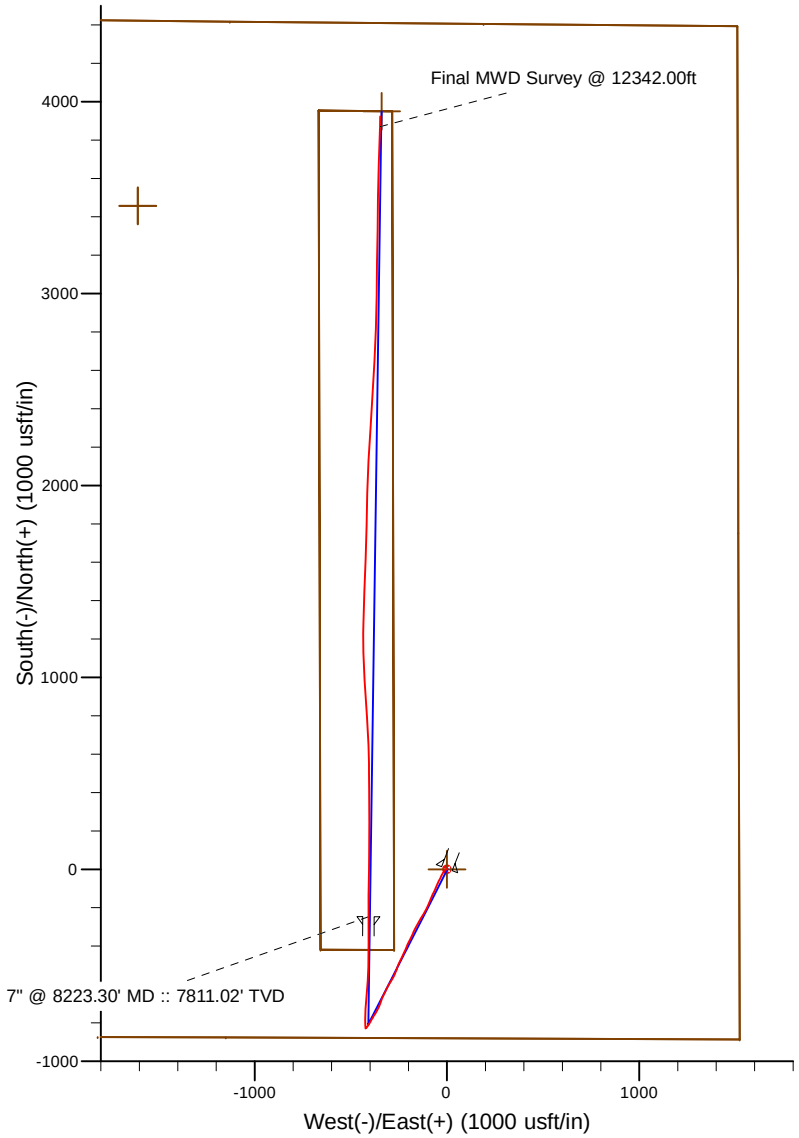
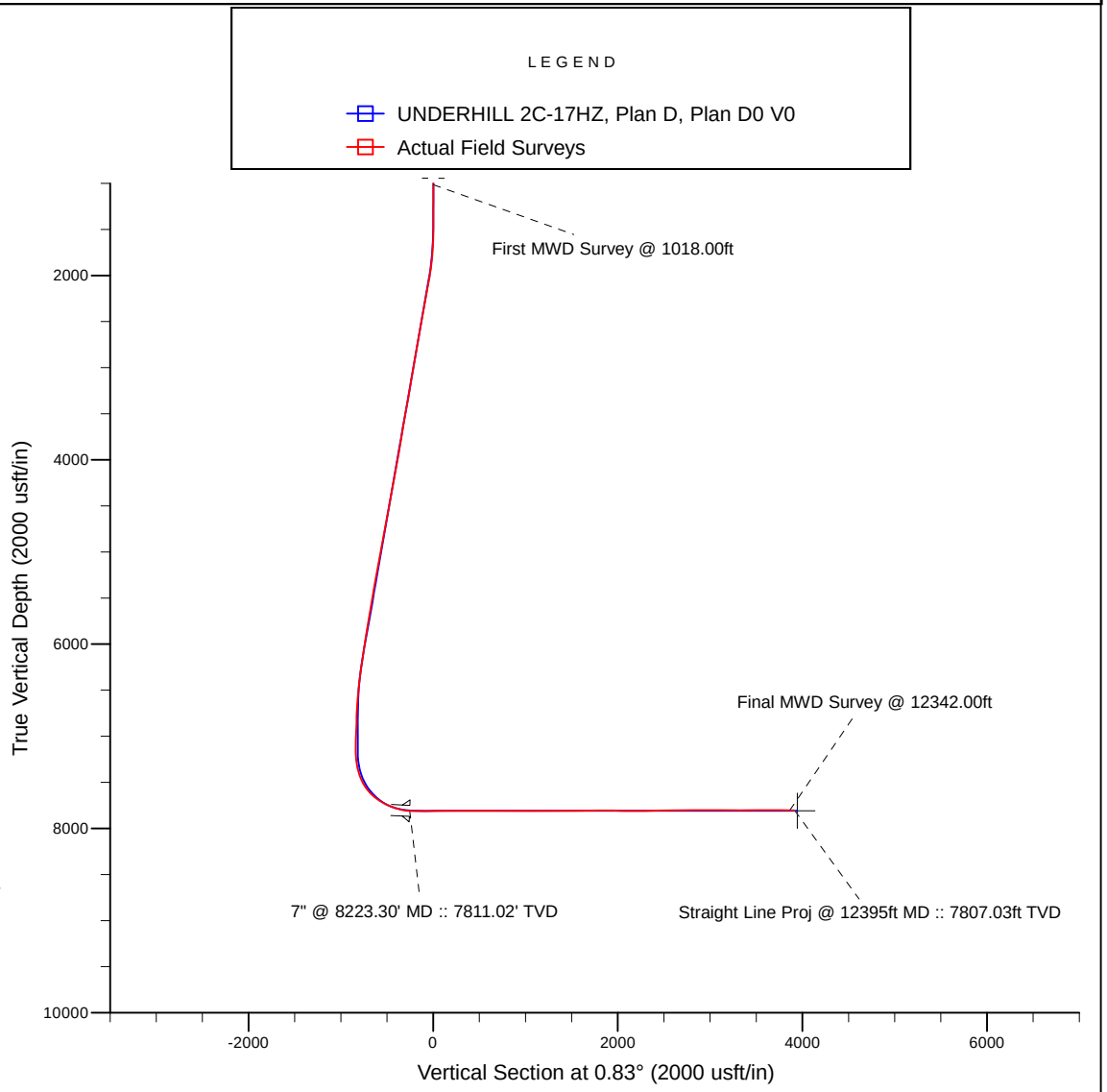
Project: Weld County, CO (NAD 83)
Site: Sec. 17-T1N-R67W
Well: UNDERHILL 2C-17HZ
Wellbore: Plan D
Design: Actual Field Surveys

Anadarko Petroleum Corporation

HALLIBURTON
Sperry Drilling





7" Casing: ~631.76' FSL, ~1928.40' FEL
Lat/Long: 40.045529 N, -104.911945 E
State Planes - CO Northern: 1,259,977.90' N, 3,164,634.73' E
Location: Sec. 17-T1N-R67W

BHL: ~486.90' FNL, ~1857.45' FEL
Lat/Long: 40.056976 N, -104.911725 E
State Planes - CO Northern: 1,264,147.80' N, 3,164,668.58' E
Location: Sec. 17-T1N-R67W

WELL DETAILS: UNDERHILL 2C-17HZ

Ground Level: 5112.00
RKB = 16' @ 5128.00usft (Xtreme 22)

Design: Actual Field Surveys (UNDERHILL 2C-17HZ/Plan D)

Created By: Clint Eshelman Date: 09/03/2013
Reviewed: _____ Date: _____

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)
Sec. 17-T1N-R67W
UNDERHILL 2C-17HZ

Plan D

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

12 September, 2013

Well Coordinates: 1,260,227.07 N, 3,165,040.79 E (40° 02' 46.34" N, 104° 54' 37.76" W)
Ground Level: 5,112.00 usft

Local Coordinate Origin:	Centered on Well UNDERHILL 2C-17HZ
Viewing Datum:	RKB = 16' @ 5128.00usft (Xtreme 22)
TVDs to System:	N
North Reference:	True
Unit System:	Dec-Deg - API - US Survey Feet - Custom

Geodetic Scale Factor Applied
Version: 5000.1 Build: 70

HALLIBURTON

Design Report for UNDERHILL 2C-17HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16.00	0.00	0.00	16.00	0.00	0.00	0.00	0.00
116.00	0.36	38.00	116.00	0.25	0.19	0.25	0.36
216.00	0.27	290.09	216.00	0.58	0.17	0.58	0.51
316.00	0.55	350.88	316.00	1.13	-0.13	1.13	0.48
416.00	0.68	12.49	415.99	2.18	-0.08	2.18	0.26
516.00	0.51	44.85	515.99	3.08	0.36	3.08	0.37
616.00	0.34	109.09	615.98	3.30	0.96	3.31	0.47
716.00	0.30	224.15	715.98	3.01	1.05	3.03	0.54
816.00	0.36	342.85	815.98	3.12	0.78	3.14	0.57
894.00	0.24	146.01	893.98	3.22	0.80	3.23	0.76
Tie-On to Gyro Surveys @ 894.00ft							
945.60	0.06	201.46	945.58	3.11	0.85	3.12	0.41
9 5/8"							
1,018.00	0.28	299.36	1,017.98	3.16	0.68	3.17	0.41
First MWD Survey @ 1018.00ft							
1,113.00	0.11	305.46	1,112.98	3.32	0.40	3.33	0.18
1,305.00	0.26	265.60	1,304.98	3.40	-0.18	3.39	0.10
1,495.00	0.48	229.18	1,494.98	2.84	-1.21	2.83	0.16
1,591.00	2.37	231.31	1,590.94	1.34	-3.07	1.30	1.97
1,686.00	3.77	227.07	1,685.80	-2.02	-6.89	-2.11	1.49
1,779.00	6.39	221.70	1,778.43	-7.96	-12.57	-8.14	2.86
1,871.00	7.66	213.19	1,869.74	-16.92	-19.33	-17.20	1.78
1,962.00	9.77	207.47	1,959.69	-28.84	-26.21	-29.22	2.50
2,054.00	11.76	206.09	2,050.06	-44.19	-33.94	-44.68	2.18
2,146.00	11.44	205.57	2,140.18	-60.84	-42.00	-61.44	0.37
2,239.00	11.04	204.95	2,231.40	-77.24	-49.74	-77.95	0.45
2,330.00	10.74	203.42	2,320.76	-92.92	-56.78	-93.73	0.46
2,422.00	11.33	204.45	2,411.06	-109.01	-63.93	-109.92	0.68
2,514.00	10.61	204.08	2,501.38	-124.97	-71.13	-125.99	0.79
2,606.00	11.98	204.52	2,591.59	-141.39	-78.55	-142.51	1.49
2,791.00	10.35	201.55	2,773.09	-174.32	-92.62	-175.64	0.93
2,974.00	10.29	205.48	2,953.13	-204.36	-105.69	-205.87	0.39
3,158.00	11.50	211.59	3,133.82	-234.82	-122.37	-236.57	0.91
3,342.00	10.96	212.56	3,314.29	-265.19	-141.39	-267.21	0.31
3,526.00	11.35	206.28	3,494.82	-296.17	-158.82	-298.44	0.69
3,708.00	9.59	205.15	3,673.78	-325.95	-173.19	-328.43	0.97
3,891.00	11.77	206.22	3,853.60	-356.50	-187.92	-359.18	1.20
4,075.00	10.98	204.16	4,033.99	-389.32	-203.38	-392.23	0.48
4,257.00	10.47	201.67	4,212.81	-420.50	-216.58	-423.60	0.38
4,434.00	11.91	207.70	4,386.45	-451.62	-231.01	-454.92	1.05
4,605.00	11.10	205.27	4,554.01	-482.13	-246.24	-485.65	0.55
4,776.00	10.58	198.59	4,721.97	-511.90	-258.28	-515.59	0.79
4,947.00	12.84	202.96	4,889.40	-544.28	-270.69	-548.14	1.42
5,118.00	11.82	211.04	5,056.46	-576.78	-287.14	-580.88	1.17
5,289.00	10.91	209.15	5,224.11	-605.92	-304.05	-610.26	0.57
5,461.00	10.04	207.58	5,393.24	-633.43	-318.92	-637.98	0.53
5,632.00	10.83	205.10	5,561.41	-661.19	-332.64	-665.94	0.53
5,804.00	10.17	197.12	5,730.54	-690.33	-343.96	-695.25	0.93
5,975.00	10.79	204.37	5,898.70	-719.34	-355.01	-724.41	0.85

Design Report for UNDERHILL 2C-17HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
6,147.00	9.85	211.84	6,067.92	-746.51	-369.42	-751.78	0.95
6,232.00	10.80	212.86	6,151.54	-759.38	-377.58	-764.77	1.14
6,318.00	9.35	210.63	6,236.21	-772.16	-385.51	-777.66	1.75
6,404.00	8.12	210.04	6,321.22	-783.43	-392.11	-789.02	1.43
6,575.00	6.44	210.26	6,490.83	-802.17	-402.99	-807.92	0.98
6,747.00	4.81	214.95	6,662.00	-816.41	-411.98	-822.29	0.98
6,918.00	2.73	223.13	6,832.62	-825.26	-418.87	-831.24	1.25
7,090.00	0.48	276.40	7,004.55	-828.17	-422.39	-834.20	1.44
7,261.00	0.60	212.57	7,175.54	-828.84	-423.58	-834.89	0.34
7,304.00	1.93	6.14	7,218.53	-828.31	-423.62	-834.36	5.77
7,347.00	4.07	6.70	7,261.47	-826.08	-423.37	-832.12	4.98
7,390.00	7.26	355.41	7,304.26	-821.85	-423.41	-827.90	7.82
7,433.00	12.74	353.52	7,346.59	-814.43	-424.16	-820.48	12.77
7,476.00	17.66	357.81	7,388.07	-803.19	-424.95	-809.26	11.73
7,519.00	20.36	1.39	7,428.72	-789.19	-425.01	-795.27	6.84
7,561.00	24.13	0.91	7,467.59	-773.30	-424.70	-779.37	8.99
7,604.00	28.92	1.51	7,506.05	-754.10	-424.29	-760.17	11.16
7,647.00	32.93	2.51	7,542.93	-732.03	-423.50	-738.08	9.40
7,690.00	36.27	2.81	7,578.32	-707.64	-422.36	-713.68	7.78
7,733.00	41.33	6.15	7,611.83	-680.80	-420.22	-686.81	12.73
7,776.00	47.46	6.28	7,642.54	-650.91	-416.96	-656.88	14.26
7,819.00	52.86	4.10	7,670.08	-618.04	-414.00	-623.97	13.15
7,862.00	57.96	2.57	7,694.48	-582.71	-411.96	-588.62	12.22
7,905.00	61.19	2.45	7,716.25	-545.67	-410.33	-551.56	7.52
7,947.00	62.93	2.70	7,735.93	-508.61	-408.67	-514.47	4.18
7,990.00	63.81	1.48	7,755.21	-470.20	-407.27	-476.05	3.26
8,033.00	67.80	359.78	7,772.83	-430.98	-406.84	-436.83	9.95
8,076.00	73.51	359.06	7,787.07	-390.43	-407.26	-396.29	13.37
8,119.00	78.05	359.94	7,797.63	-348.76	-407.62	-354.63	10.74
8,162.00	80.99	359.81	7,805.45	-306.48	-407.71	-312.36	6.84
8,188.00	84.88	359.85	7,808.64	-280.69	-407.79	-286.56	14.96
8,222.30	87.18	0.37	7,811.02	-246.47	-407.72	-252.35	6.87
7" @ 8223.30' MD :: 7811.02' TVD							
8,245.00	88.70	0.72	7,811.84	-223.79	-407.50	-229.67	6.87
8,331.00	90.31	0.44	7,812.58	-137.80	-406.63	-143.67	1.90
8,374.00	90.43	0.12	7,812.30	-94.80	-406.42	-100.68	0.79
8,459.00	90.80	0.74	7,811.39	-9.81	-405.79	-15.69	0.85
8,545.00	91.24	0.83	7,809.86	76.17	-404.61	70.30	0.52
8,716.00	89.75	359.75	7,808.38	247.15	-403.74	241.28	1.08
8,887.00	89.75	359.81	7,809.13	418.15	-404.40	412.25	0.04
9,059.00	89.26	358.72	7,810.61	590.13	-406.61	584.18	0.69
9,230.00	90.12	356.90	7,811.54	760.99	-413.14	754.93	1.18
9,402.00	90.43	355.58	7,810.71	932.62	-424.42	926.37	0.79
9,573.00	90.12	358.09	7,809.89	1,103.34	-433.86	1,096.94	1.48
9,745.00	89.88	1.36	7,809.89	1,275.31	-434.68	1,268.88	1.91
9,916.00	89.57	2.39	7,810.71	1,446.22	-429.09	1,439.85	0.63
10,088.00	91.05	2.10	7,809.78	1,618.08	-422.35	1,611.79	0.88
10,259.00	90.80	1.10	7,807.02	1,788.99	-417.58	1,782.75	0.60
10,431.00	88.58	1.18	7,807.95	1,960.94	-414.16	1,954.73	1.29
10,602.00	89.69	3.60	7,810.53	2,131.76	-407.03	2,125.64	1.56
10,774.00	90.49	3.35	7,810.26	2,303.44	-396.60	2,297.45	0.49

Design Report for UNDERHILL 2C-17HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
10,945.00	91.42	3.38	7,807.41	2,474.12	-386.57	2,468.26	0.54
11,117.00	90.62	3.06	7,804.35	2,645.82	-376.91	2,640.08	0.50
11,288.00	89.69	1.87	7,803.89	2,816.65	-369.55	2,811.00	0.88
11,460.00	90.80	0.67	7,803.15	2,988.60	-365.74	2,982.99	0.95
11,631.00	89.51	1.09	7,802.69	3,159.58	-363.11	3,153.99	0.79
11,802.00	89.38	0.96	7,804.35	3,330.54	-360.05	3,324.98	0.11
11,973.00	91.11	0.38	7,803.62	3,501.52	-358.06	3,495.97	1.07
12,145.00	89.94	2.15	7,802.04	3,673.46	-354.26	3,667.95	1.23
12,342.00	88.15	1.67	7,805.32	3,870.32	-347.69	3,864.88	0.94
Final MWD Survey @ 12342.00ft							
12,395.00	88.15	1.67	7,807.03	3,923.27	-346.15	3,917.84	0.00
Straight Line Proj @ 12395ft MD :: 7807.03ft TVD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
894.00	893.98	3.22	0.80	Tie-On to Gyro Surveys @ 894.00ft
1,018.00	1,017.98	3.16	0.68	First MWD Survey @ 1018.00ft
12,342.00	7,805.32	3,870.32	-347.69	Final MWD Survey @ 12342.00ft
12,395.00	7,807.03	3,923.27	-346.15	Straight Line Proj @ 12395ft MD :: 7807.03ft TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.83	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
16.00	894.00	MS Energy Surveys	NS-GYRO-MS
1,018.00	8,188.00	MWD Vertical/Build Surveys	MWD+SC
8,188.00	12,342.00	MWD Surveys Lateral	MWD+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
945.60	945.58	9 5/8"	9-5/8	13-1/2
8,222.30	7,811.02	7" @ 8223.30' MD :: 7811.02' TVD	7	8-3/4

Design Report for UNDERHILL 2C-17HZ - Actual Field Surveys

Wellbore Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Underhil 2C-17HZ_SH - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	1,260,227.07	3,165,040.79	40.046206	-104.910488
Underhil 2C-17HZ_BH - actual wellpath misses target center by 27.52usft at 12395.00usft MD (7807.03 TVD, 3923.27 N, -346.15 E) - Point	0.00	0.00	7,808.00	3,950.03	-339.83	1,264,174.61	3,164,674.72	40.057049	-104.911702

Directional Difficulty Index

Average Dogleg over Survey:	1.53 °/100usft	Maximum Dogleg over Survey:	14.96 °/100usft at 8,188.00 usft
Net Tortousity applicable to Plans:	0.59 °/100usft	Directional Difficulty Index:	6.235

Audit Info

North Reference Sheet for Sec. 17-T1N-R67W - UNDERHILL 2C-17HZ - Plan D

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB = 16' @ 5128.00usft (Xtreme 22). Northing and Easting are relative to UNDERHILL 2C-17HZ

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996318

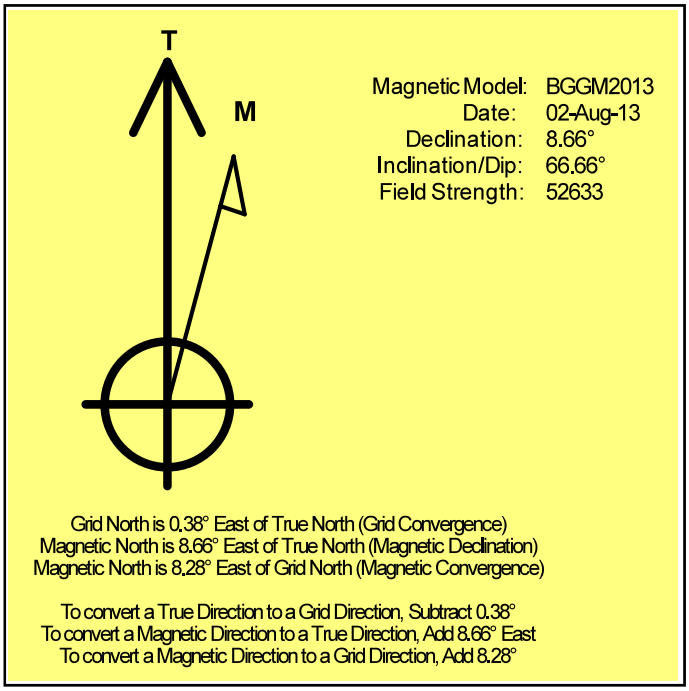
Grid Coordinates of Well: 1,260,227.07 usft N, 3,165,040.79 usft E

Geographical Coordinates of Well: 40° 02' 46.34" N, 104° 54' 37.76" W

Grid Convergence at Surface is: 0.38°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,395.00usft
the Bottom Hole Displacement is 3,938.51usft in the Direction of 354.96° (True).

Magnetic Convergence at surface is: -8.28° (2 August 2013, , BGGM2013)



Anadarko Petroleum Corp.

Weld County, CO (NAD 83)
Sec. 17-T1N-R67W
UNDERHILL 2C-17HZ

Plan D

Design: Actual Field Surveys

Sperry Drilling Services

Geodetic Report

12 September, 2013

Well Coordinates: 1,260,227.07 N, 3,165,040.79 E (40° 02' 46.34" N, 104° 54' 37.76" W)
Ground Level: 5,112.00 usft

Local Coordinate Origin:	Centered on Well UNDERHILL 2C-17HZ
Viewing Datum:	RKB = 16' @ 5128.00usft (Xtreme 22)
TVDs to System:	N
North Reference:	True
Unit System:	Dec-Deg - API - US Survey Feet - Custom

Geodetic Scale Factor Applied
Version: 5000.1 Build: 70

HALLIBURTON

Design Report for UNDERHILL 2C-17HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	40.046206	-104.910488	1,260,227.07	3,165,040.79
16.00	0.00	0.00	16.00	0.00	0.00	40.046206	-104.910488	1,260,227.07	3,165,040.79
116.00	0.36	38.00	116.00	0.25	0.19	40.046207	-104.910488	1,260,227.32	3,165,040.98
216.00	0.27	290.09	216.00	0.58	0.17	40.046208	-104.910488	1,260,227.64	3,165,040.95
316.00	0.55	350.88	316.00	1.13	-0.13	40.046209	-104.910489	1,260,228.20	3,165,040.65
416.00	0.68	12.49	415.99	2.18	-0.08	40.046212	-104.910489	1,260,229.25	3,165,040.70
516.00	0.51	44.85	515.99	3.08	0.36	40.046214	-104.910487	1,260,230.15	3,165,041.13
616.00	0.34	109.09	615.98	3.30	0.96	40.046215	-104.910485	1,260,230.37	3,165,041.73
716.00	0.30	224.15	715.98	3.01	1.05	40.046214	-104.910484	1,260,230.09	3,165,041.83
816.00	0.36	342.85	815.98	3.12	0.78	40.046215	-104.910485	1,260,230.20	3,165,041.55
894.00	0.24	146.01	893.98	3.22	0.80	40.046215	-104.910485	1,260,230.29	3,165,041.57
945.60	0.06	201.46	945.58	3.11	0.85	40.046215	-104.910485	1,260,230.18	3,165,041.62
1,018.00	0.28	299.36	1,017.98	3.16	0.68	40.046215	-104.910486	1,260,230.23	3,165,041.45
1,113.00	0.11	305.46	1,112.98	3.32	0.40	40.046215	-104.910487	1,260,230.39	3,165,041.17
1,305.00	0.26	265.60	1,304.98	3.40	-0.18	40.046215	-104.910489	1,260,230.46	3,165,040.59
1,495.00	0.48	229.18	1,494.98	2.84	-1.21	40.046214	-104.910493	1,260,229.90	3,165,039.56
1,591.00	2.37	231.31	1,590.94	1.34	-3.07	40.046210	-104.910499	1,260,228.39	3,165,037.72
1,686.00	3.77	227.07	1,685.80	-2.02	-6.89	40.046200	-104.910513	1,260,225.01	3,165,033.92
1,779.00	6.39	221.70	1,778.43	-7.96	-12.57	40.046184	-104.910533	1,260,219.02	3,165,028.28
1,871.00	7.66	213.19	1,869.74	-16.92	-19.33	40.046160	-104.910557	1,260,210.02	3,165,021.57
1,962.00	9.77	207.47	1,959.69	-28.84	-26.21	40.046127	-104.910582	1,260,198.05	3,165,014.77
2,054.00	11.76	206.09	2,050.06	-44.19	-33.94	40.046085	-104.910609	1,260,182.65	3,165,007.15
2,146.00	11.44	205.57	2,140.18	-60.84	-42.00	40.046039	-104.910638	1,260,165.95	3,164,999.20
2,239.00	11.04	204.95	2,231.40	-77.24	-49.74	40.045994	-104.910666	1,260,149.50	3,164,991.57
2,330.00	10.74	203.42	2,320.76	-92.92	-56.78	40.045951	-104.910691	1,260,133.78	3,164,984.63
2,422.00	11.33	204.45	2,411.06	-109.01	-63.93	40.045907	-104.910717	1,260,117.64	3,164,977.59
2,514.00	10.61	204.08	2,501.38	-124.97	-71.13	40.045863	-104.910742	1,260,101.63	3,164,970.50
2,606.00	11.98	204.52	2,591.59	-141.39	-78.55	40.045818	-104.910769	1,260,085.16	3,164,963.19
2,791.00	10.35	201.55	2,773.09	-174.32	-92.62	40.045727	-104.910819	1,260,052.14	3,164,949.34
2,974.00	10.29	205.48	2,953.13	-204.36	-105.69	40.045645	-104.910866	1,260,022.01	3,164,936.47
3,158.00	11.50	211.59	3,133.82	-234.82	-122.37	40.045561	-104.910925	1,259,991.44	3,164,919.99
3,342.00	10.96	212.56	3,314.29	-265.19	-141.39	40.045478	-104.910993	1,259,960.95	3,164,901.17
3,526.00	11.35	206.28	3,494.82	-296.17	-158.82	40.045393	-104.911056	1,259,929.86	3,164,883.95
3,708.00	9.59	205.15	3,673.78	-325.95	-173.19	40.045311	-104.911107	1,259,899.98	3,164,869.77
3,891.00	11.77	206.22	3,853.60	-356.50	-187.92	40.045227	-104.911159	1,259,869.34	3,164,855.25
4,075.00	10.98	204.16	4,033.99	-389.32	-203.38	40.045137	-104.911215	1,259,836.42	3,164,840.01
4,257.00	10.47	201.67	4,212.81	-420.50	-216.58	40.045052	-104.911262	1,259,805.15	3,164,827.01
4,434.00	11.91	207.70	4,386.45	-451.62	-231.01	40.044966	-104.911313	1,259,773.93	3,164,812.79
4,605.00	11.10	205.27	4,554.01	-482.13	-246.24	40.044882	-104.911368	1,259,743.33	3,164,797.77
4,776.00	10.58	198.59	4,721.97	-511.90	-258.28	40.044801	-104.911411	1,259,713.48	3,164,785.93
4,947.00	12.84	202.96	4,889.40	-544.28	-270.69	40.044712	-104.911455	1,259,681.02	3,164,773.73
5,118.00	11.82	211.04	5,056.46	-576.78	-287.14	40.044623	-104.911514	1,259,648.41	3,164,757.50

Design Report for UNDERHILL 2C-17HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
5,289.00	10.91	209.15	5,224.11	-605.92	-304.05	40.044543	-104.911574	1,259,619.16	3,164,740.79
5,461.00	10.04	207.58	5,393.24	-633.43	-318.92	40.044467	-104.911627	1,259,591.56	3,164,726.10
5,632.00	10.83	205.10	5,561.41	-661.19	-332.64	40.044391	-104.911676	1,259,563.71	3,164,712.57
5,804.00	10.17	197.12	5,730.54	-690.33	-343.96	40.044311	-104.911717	1,259,534.49	3,164,701.44
5,975.00	10.79	204.37	5,898.70	-719.34	-355.01	40.044231	-104.911756	1,259,505.40	3,164,690.58
6,147.00	9.85	211.84	6,067.92	-746.51	-369.42	40.044157	-104.911808	1,259,478.14	3,164,676.36
6,232.00	10.80	212.86	6,151.54	-759.38	-377.58	40.044121	-104.911837	1,259,465.22	3,164,668.29
6,318.00	9.35	210.63	6,236.21	-772.16	-385.51	40.044086	-104.911865	1,259,452.39	3,164,660.44
6,404.00	8.12	210.04	6,321.22	-783.43	-392.11	40.044055	-104.911889	1,259,441.08	3,164,653.92
6,575.00	6.44	210.26	6,490.83	-802.17	-402.99	40.044004	-104.911928	1,259,422.27	3,164,643.16
6,747.00	4.81	214.95	6,662.00	-816.41	-411.98	40.043965	-104.911960	1,259,407.97	3,164,634.26
6,918.00	2.73	223.13	6,832.62	-825.26	-418.87	40.043941	-104.911984	1,259,399.07	3,164,627.43
7,090.00	0.48	276.40	7,004.55	-828.17	-422.39	40.043933	-104.911997	1,259,396.14	3,164,623.93
7,261.00	0.60	212.57	7,175.54	-828.84	-423.58	40.043931	-104.912001	1,259,395.46	3,164,622.75
7,304.00	1.93	6.14	7,218.53	-828.31	-423.62	40.043932	-104.912001	1,259,395.99	3,164,622.70
7,347.00	4.07	6.70	7,261.47	-826.08	-423.37	40.043938	-104.912000	1,259,398.22	3,164,622.94
7,390.00	7.26	355.41	7,304.26	-821.85	-423.41	40.043950	-104.912001	1,259,402.45	3,164,622.87
7,433.00	12.74	353.52	7,346.59	-814.43	-424.16	40.043970	-104.912003	1,259,409.87	3,164,622.07
7,476.00	17.66	357.81	7,388.07	-803.19	-424.95	40.044001	-104.912006	1,259,421.10	3,164,621.21
7,519.00	20.36	1.39	7,428.72	-789.19	-425.01	40.044040	-104.912006	1,259,435.10	3,164,621.05
7,561.00	24.13	0.91	7,467.59	-773.30	-424.70	40.044083	-104.912005	1,259,450.99	3,164,621.26
7,604.00	28.92	1.51	7,506.05	-754.10	-424.29	40.044136	-104.912004	1,259,470.19	3,164,621.54
7,647.00	32.93	2.51	7,542.93	-732.03	-423.50	40.044197	-104.912001	1,259,492.27	3,164,622.18
7,690.00	36.27	2.81	7,578.32	-707.64	-422.36	40.044263	-104.911997	1,259,516.66	3,164,623.16
7,733.00	41.33	6.15	7,611.83	-680.80	-420.22	40.044337	-104.911989	1,259,543.52	3,164,625.12
7,776.00	47.46	6.28	7,642.54	-650.91	-416.96	40.044419	-104.911978	1,259,573.43	3,164,628.18
7,819.00	52.86	4.10	7,670.08	-618.04	-414.00	40.044509	-104.911967	1,259,606.31	3,164,630.92
7,862.00	57.96	2.57	7,694.48	-582.71	-411.96	40.044606	-104.911960	1,259,641.65	3,164,632.73
7,905.00	61.19	2.45	7,716.25	-545.67	-410.33	40.044708	-104.911954	1,259,678.70	3,164,634.11
7,947.00	62.93	2.70	7,735.93	-508.61	-408.67	40.044810	-104.911948	1,259,715.77	3,164,635.53
7,990.00	63.81	1.48	7,755.21	-470.20	-407.27	40.044915	-104.911943	1,259,754.19	3,164,636.67
8,033.00	67.80	359.78	7,772.83	-430.98	-406.84	40.045023	-104.911941	1,259,793.40	3,164,636.84
8,076.00	73.51	359.06	7,787.07	-390.43	-407.26	40.045134	-104.911943	1,259,833.95	3,164,636.15
8,119.00	78.05	359.94	7,797.63	-348.76	-407.62	40.045249	-104.911944	1,259,875.61	3,164,635.51
8,162.00	80.99	359.81	7,805.45	-306.48	-407.71	40.045365	-104.911944	1,259,917.89	3,164,635.14
8,188.00	84.88	359.85	7,808.64	-280.69	-407.79	40.045435	-104.911945	1,259,943.69	3,164,634.89
8,222.30	87.18	0.37	7,811.02	-246.47	-407.72	40.045529	-104.911945	1,259,977.90	3,164,634.73
8,245.00	88.70	0.72	7,811.84	-223.79	-407.50	40.045592	-104.911944	1,260,000.58	3,164,634.80
8,331.00	90.31	0.44	7,812.58	-137.80	-406.63	40.045828	-104.911941	1,260,086.57	3,164,635.10
8,374.00	90.43	0.12	7,812.30	-94.80	-406.42	40.045946	-104.911940	1,260,129.57	3,164,635.02
8,459.00	90.80	0.74	7,811.39	-9.81	-405.79	40.046179	-104.911938	1,260,214.56	3,164,635.09
8,545.00	91.24	0.83	7,809.86	76.17	-404.61	40.046415	-104.911933	1,260,300.54	3,164,635.70

Design Report for UNDERHILL 2C-17HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
8,716.00	89.75	359.75	7,808.38	247.15	-403.74	40.046884	-104.911930	1,260,471.52	3,164,635.43
8,887.00	89.75	359.81	7,809.13	418.15	-404.40	40.047354	-104.911933	1,260,642.50	3,164,633.64
9,059.00	89.26	358.72	7,810.61	590.13	-406.61	40.047826	-104.911941	1,260,814.46	3,164,630.29
9,230.00	90.12	356.90	7,811.54	760.99	-413.14	40.048295	-104.911964	1,260,985.27	3,164,622.62
9,402.00	90.43	355.58	7,810.71	932.62	-424.42	40.048766	-104.912004	1,261,156.81	3,164,610.20
9,573.00	90.12	358.09	7,809.89	1,103.34	-433.86	40.049235	-104.912038	1,261,327.46	3,164,599.62
9,745.00	89.88	1.36	7,809.89	1,275.31	-434.68	40.049707	-104.912041	1,261,499.41	3,164,597.65
9,916.00	89.57	2.39	7,810.71	1,446.22	-429.09	40.050176	-104.912021	1,261,670.35	3,164,602.11
10,088.00	91.05	2.10	7,809.78	1,618.08	-422.35	40.050648	-104.911997	1,261,842.24	3,164,607.71
10,259.00	90.80	1.10	7,807.02	1,788.99	-417.58	40.051117	-104.911980	1,262,013.17	3,164,611.34
10,431.00	88.58	1.18	7,807.95	1,960.94	-414.16	40.051589	-104.911968	1,262,185.14	3,164,613.62
10,602.00	89.69	3.60	7,810.53	2,131.76	-407.03	40.052058	-104.911942	1,262,355.99	3,164,619.62
10,774.00	90.49	3.35	7,810.26	2,303.44	-396.60	40.052529	-104.911905	1,262,527.73	3,164,628.90
10,945.00	91.42	3.38	7,807.41	2,474.12	-386.57	40.052998	-104.911869	1,262,698.47	3,164,637.80
11,117.00	90.62	3.06	7,804.35	2,645.82	-376.91	40.053469	-104.911835	1,262,870.22	3,164,646.32
11,288.00	89.69	1.87	7,803.89	2,816.65	-369.55	40.053938	-104.911808	1,263,041.10	3,164,652.54
11,460.00	90.80	0.67	7,803.15	2,988.60	-365.74	40.054410	-104.911795	1,263,213.06	3,164,655.21
11,631.00	89.51	1.09	7,802.69	3,159.58	-363.11	40.054879	-104.911785	1,263,384.04	3,164,656.70
11,802.00	89.38	0.96	7,804.35	3,330.54	-360.05	40.055349	-104.911774	1,263,555.02	3,164,658.62
11,973.00	91.11	0.38	7,803.62	3,501.52	-358.06	40.055818	-104.911767	1,263,726.00	3,164,659.48
12,145.00	89.94	2.15	7,802.04	3,673.46	-354.26	40.056290	-104.911754	1,263,897.96	3,164,662.13
12,342.00	88.15	1.67	7,805.32	3,870.32	-347.69	40.056830	-104.911730	1,264,094.84	3,164,667.39
12,395.00	88.15	1.67	7,807.03	3,923.27	-346.15	40.056976	-104.911725	1,264,147.80	3,164,668.58

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
894.00	893.98	3.22	0.80	Tie-On to Gyro Surveys @ 894.00ft
1,018.00	1,017.98	3.16	0.68	First MWD Survey @ 1018.00ft
12,342.00	7,805.32	3,870.32	-347.69	Final MWD Survey @ 12342.00ft
12,395.00	7,807.03	3,923.27	-346.15	Straight Line Proj @ 12395ft MD :: 7807.03ft TVD

Design Report for UNDERHILL 2C-17HZ - Actual Field Surveys

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.83	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
16.00	894.00	MS Energy Surveys	NS-GYRO-MS
1,018.00	8,188.00	MWD Vertical/Build Surveys	MWD+SC
8,188.00	12,342.00	MWD Surveys Lateral	MWD+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
945.60	945.58	9 5/8"	9-5/8	13-1/2
8,222.30	7,811.02	7" @ 8223.30' MD :: 7811.02' TVD	7	8-3/4

Design Targets

Shape	Target Name	TVD (usft)	Northing (usft)	Easting (usft)	+N/-S usft	+E/-W usft	Created	Updated
Point	Underhil 2C-17HZ_SHL	0.00	1,260,227.07	3,165,040.79	0.00	0.00	8/2/2013	8/5/2013
Point	Underhil 2C-17HZ_BHL	7,808.00	1,264,174.61	3,164,674.72	3,950.03	-339.83	8/2/2013	8/12/2013

Directional Difficulty Index

Average Dogleg over Survey:	1.53 °/100usft	Maximum Dogleg over Survey:	14.96 °/100usft at 8,188.00 usft
Net Tortousity applicable to Plans:	0.59 °/100usft	Directional Difficulty Index:	6.235

Design Report for UNDERHILL 2C-17HZ - Actual Field Surveys

Audit Info

North Reference Sheet for Sec. 17-T1N-R67W - UNDERHILL 2C-17HZ - Plan D

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB = 16' @ 5128.00usft (Xtreme 22). Northing and Easting are relative to UNDERHILL 2C-17HZ

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996318

Grid Coordinates of Well: 1,260,227.07 usft N, 3,165,040.79 usft E

Geographical Coordinates of Well: 40° 02' 46.34" N, 104° 54' 37.76" W

Grid Convergence at Surface is: 0.38°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,395.00usft

the Bottom Hole Displacement is 3,938.51usft in the Direction of 354.96° (True).

Magnetic Convergence at surface is: -8.28° (2 August 2013, , BGGM2013)